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The Correlation Between the Complaints and the Length of Complaints by Disc Displacement Temporomandibular Joint Disorders in Magnetic Resonance Imaging Examination

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Abstract

Temporomandibular Joint Disorders (TMD) is a set of symptoms or signs involving musculoskeletal disorders, temporomandibular joint, or both. Most of them are often caused by internal disorders that refer to a change in the normal TMJ joint motion paths mostly involving articular disc function. Although the prevalence is high, the exact diagnosis is often difficult because the symptoms associated with TMD vary. MRI is a device with good imaging capabilities for soft tissue and solid as well as for the evaluation of the temporomandibular joint. MRI allows three-dimensional analysis of the TMD, provide the most complete assessment of the relationship of mandible condylus, articular disc, mandibular fossa and articular eminence. This study aims to assess the relationship between the length of complaint with disc displacement based on the results of an MRI examination. The study was observational with cross sectional design. The population of patients was those with clinical signs and symptoms of TMD. The sample involved as many as 20 patients of the population with clinical signs and symptoms of TMD, either unilaterally or bilaterally. The 20 patients underwent MRI TMJ examination. Results: Patients with anterior disc displacement with the length of complaints of less than 1 year was found 4 patients (10%) and the number of complaints over 1 year was found 16 patients (90%).

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Bivariate analysis using the Fisher exact statistical test showed that there was a significant relationship between the complaint and the length of complaint with disc displacement (P <0.05). Conclusion of this study Disc displacement in MRI correlates well with the length of complaints and grievances.

Keywords: Temporomandibular joint disorders; symptoms; onset; magnetic resonance imaging.

1. Introduction

Temporomandibular joint disorders (TMD) is the term used for a group of symptoms or signs involving the musculoskeletal disorders, temporomandibular joint, or both. In addition to internal disorder which refers to a change in the path of motion of the normal temporomandibular joint (TMJ) mostly involving function discus articular, it can be also caused by a variety of interrelated factors, namely local circumstances which consist of a contact relationship occlusion, activity and response in muscles as well as joint structure. This joint disorder can be from the component joint or the outside of the component joint, such as teeth, including periodontal tissues, muscles of mastication and psychological problems [1-2].

Complaints of pain can be caused when opening-closing the mouth, tenderness in the masticatory muscles to the limitations of the temporomandibular joint movement. This will affect a function of chewing, talking and swallowing. Signs or symptoms were found (about 12% - 68%) in the population with the most incidence in young women with a ratio of 4:1 compared to men. Prevalence according to age increased in the age under 40 years and decreased in the age over 40 [3-4].

Various clinical symptoms causing proper diagnosis was often difficult to do. Evaluation of a patient ranged in anamnesis medical history, clinical examination of the temporomandibular joint, clinical examination of the muscles of mastication, intraoral examination, occlusion analysis and radiology inspection [5-7].

The Research Diagnostic Criteria (RDC) is widely accepted as a diagnostic classification, and its validity has been tested several times, so it is now regarded as the gold standard by the research community, but it still has a value of subjectivity in the assessment. So, we need another modality to assess the structure of the temporomandibular joint clearly [8-10].

MRI is a device with good imaging capabilities for soft tissue and solid as well as for the evaluation of the temporomandibular joint. MRI allows three-dimensional analysis of the TMJ, providing the most complete assessment of the relationship among mandible condylus, articular disc, mandibular fossa and articular eminence. The various MRI techniques allow us to analyze the position of both the coronal and sagittal discus in the form of the assessment of condylar translation dynamics during the discus movement in opening and closing the mouth, can properly assess the discus articularis from the changes of shape and intensity of the signal or disc displacement, lateral pterygoid muscle (LPM) thickening, the outbreak of retrodiscal layer or joint effusion. Disc displacement (DD) is one of the main forms of internal TMJ disorders. Anterior disc displacement with reduction (ADDWR) and anterior disc displacement without reduction (ADDWoR) are the two most common forms [11-15].

MRI research on temporomandibular joint disorders is still very under-reported in Indonesia, especially in South Sulawesi.

2. Materials and Methods

The method used in this research was observational cross-sectional design, The population of patients was those with clinical symptoms of TMD, either unilaterally or bilaterally. The sample involved as many as 20 patients of the population with clinical signs and symptoms of TMD, either unilaterally or bilaterally. The 20 patients underwent MRI TMJ examination: using Digital MRI scanner (1.5 T, GE) with a head coil. Mouth with closed and open position with the examination protocol is oblique sagittal PD (thickness of pieces was 2 mm slice thickness, 0.5 mm slice gap, repetition time 2500 ms, echo time 32 ms, acquisition matrix size of 256 x 224). Oblique sagittal T1W and T2W (Repetition time 3999 ms, echo time 65 ms). Evaluation of bilateral TMJ is the position of the disc (disc displacement).

3. Result

The data show that there is no significant difference in asymptomatic patient characteristics with symptomatic patients, except for complaints and duration of complaints. The majority of symptomatic patients were sound, afterwards sound and pain (Table 1).

Table 1: Characteristics of Respondents

Characteristics	**Group**				**P**
	Symptomatic		**Asymptomatic**		
	n	**%**	**n**	**&**	
Gender					
Man	5	12.5	4	10.0	0.500*
Woman	15	37.5	16	40.0	
Age					
<20 years	3	7.5	0	0	0.193*
20-40 years	14	35.0	17	42.5	
> 40 years	3	7.5	3	7.5	
Complaint					
No	0	0.0	20	50.0	
Sound (Clicking)	9	22.6	0	0.0	0.000*
Pain	4	10.0	0	0.0	
Sound and Pain	7	17.5.	0	0.0	
Length of Complaints					
There is no	0	0.0	20	50.0	0.000*
<1 year	4	10.0	0	0.0	
> 1 year	16	40.0	0	0.0	
Chewing Dominant					
Right	14	35.0	15	37.5	0.736*
Left	6	15.0	5	12.5	

**Fisher Exact Test*

The results of the analysis showed that patients with more than a year of complaints had more frequent frequency of disc dispalecement (DD) and statistical tests showed a significant relationship between the length of complaints and disc displacement (Table 2).

Table 2: The length of complaints relationship with Disc Displacement by MRI examination

		Diagnosis MRI		Total	P
		Normal	Disc Displacement		
Length of Complaints	<1 year	18 (45.0)	6 (15.0)	24 (60.0)	0.000*
	> 1 year	2 (5.0)	14 35.0)	16 (40.0)	

Chi Square Test

4. Discussion

In this study, the incidence in women was more common than men. While the majority of complaints was clicking sound. Clicking sound was often associated with lateral pterygoid muscle spasm. Although the intermittent clicking sound accompanied the lateral pterygoid spasm that occurs in some patients, it did not necessarily indicate the early symptoms of TMD [6,16].

Other symptoms of TMD was dysfunction and muscle aches either unilaterally or bilaterally, especially around the face and masticatory muscles. Patients complain of pain not only muscles but also the stiffness of the jaw, droop and difficulty opening the mouth along with other complaints such as otalgia and tinnitus. Increased emotional stress can also affect the function of mastication. Temporomandibular joint limitations can be found mild to severe, limited movement of the mandible is one of the main symptoms of myofascial TMD [9-11].

Trauma factors that occur in the facial structure can also cause functional disorders of the masticatory system and the more influence the occurrence of intracapsular disorders than muscular disorders. *Macrotrauma* (Force suddenly can cause structural alteration, such as the direct impact to the face) and microtrauma (small force that occur repeatedly in a structure in a long period of time). This is in line with our research which found a significant correlation between the length of complaint with the disc displacement. Therefore, early diagnosis to determine the cause of TMD is very important in preventing the disease to be chronic [16-19].

From the results of MRI in this study, those with disc displacement was found in 15% of patients with the length of complaints of less than 1 year and 35% with the length of complaints of more than 1 year. Statistical test showed a significant relationship between duration of complaints with disc displacement. *De Leeuw* and his colleagues conducted research (55 patients) and reported that 75% with symptoms of chronic TMJ internal disorders had anterior disc displacement without reduction [1,10,15].

The researchers expect that the excellence of MRI in diagnosing TMD can be introduced widely, especially in

South Sulawesi.

5. Conclusion

Patients with symptoms of more than one year had more frequency of experiencing disc displacement.

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6. Competing Interests

The authors declare that they have no competing interests.

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